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Education:

- Ph.D. in Elementary Particle Physics, Stony Brook University, Stony Brook, NY (2006)
Dissertation Supervisor: John Hobbs
Dissertation: *A Search for the Production of Technicolor Particles at the DØ Detector*
- Master of Arts, Physics, Stony Brook University, Stony Brook, NY (1998)
- Bachelor of Arts, Physics, Cum Laude, Franklin and Marshall College, Lancaster, PA (1997)
Honors Thesis Adviser: Russel Kauffman
Honors Thesis: *Production of a Higgs Pseudoscalar Plus Two Jets in Hadronic Collisions*

Honors and Awards:

- Kershner Scholar, 1996, 1997, awarded for academic achievement in physics.
- Member Sigma Pi Sigma physics honors society since 1996.
- Presidential Scholar, 1993 - 1997, awarded for general academic achievement.

Positions:

- Research Associate, Fermi National Accelerator Laboratory, Batavia, IL (2006 - present)
- Graduate Research Assistant, Stony Brook University, Stony Brook, NY
DØ experiment, with Prof. John Hobbs (1998 - 2006)
DØ experiment, with Prof. Michael Rijssenbeek (1997)
- Teaching Assistant, Stony Brook University, Stony Brook, NY (1997-1998)
- Undergraduate Research Assistant, Franklin and Marshall College, Lancaster, PA (1996 - 1997)
- Undergraduate Teaching Assistant, Franklin and Marshall College, Lancaster, PA (1995 - 1997)
- Undergraduate Physics Tutor, Franklin and Marshall College, Lancaster, PA (1995 - 1997)

Experience:

Searches for the Source of Electroweak Symmetry Breaking

Since September 2010, I have been a co-convenor of the DØ low mass Higgs group. In this capacity, I guide the most sensitive searches for a standard model Higgs boson with a mass of less than ~ 135 GeV. During my time in this position, the group has published searches for the $WH \rightarrow \ell\nu b\bar{b}$ and $H \rightarrow W^+W^- \rightarrow \ell\nu jj$ processes; a response to the excess seen in W +dijet events by CDF; and preliminary updates to all of the most sensitive channels for a low mass Higgs boson for the EPS 2011 conference.

I also lead the $ZH \rightarrow \ell^+\ell^-b\bar{b}$ analysis team, which includes four postdocs and four students. I coordinate the analysis of four channels, including two specialized channels that extend the acceptance for $Z \rightarrow \ell\ell$ decays. My present work is focused on improving the identification of b -jets and optimizing the multivariate analysis used to identify the Higgs signal. These efforts have resulted in a publication in Physical Review Letters using a 4.2 fb^{-1} dataset, and two preliminary updates of the result, using 6.2 fb^{-1} and 8.6 fb^{-1} .

My dissertation was based on a search for technicolor in the $\rho_{TC} \rightarrow W\pi_{TC} \rightarrow \mu\nu b\bar{b}/b\bar{c}$ channel. In addition to determining the initial selection requirements, I designed a random grid search to obtain separately optimized analyses for 20 mass hypotheses.

Internal Review of $t\bar{t}$ Cross Sections

Since 2008, I have been an active participant in the internal review boards for the DØ $t\bar{t}$ cross section measurements. In this capacity, I have also reviewed several results in similar final states, including searches for scalar top quarks, charged Higgs bosons from $t\bar{t}$ decays, and $t\bar{t}H$ production.

Higgs Cross Section Calculations

I calculated the production cross sections for a Higgs boson plus additional jets in gluon fusion processes. This work resulted in two papers, one for a standard model Higgs and one for a pseudoscalar Higgs boson, as predicted by multi-Higgs doublet models such as supersymmetry. The latter formed the basis for my undergraduate honors thesis.

Tracking System Operations at DØ

I was co-leader of the operations group for the DØ silicon microstrip tracker (SMT) from December 2006 through July 2008, and remain an active member of that group. I managed the silicon tracker repair activities during a long shutdown in the summer of 2007. This resulted in the recovery of a substantial number of disabled channels. I was deeply involved in subsequent shutdowns in October 2008 and the summer of 2009. As a consequence of these efforts, the SMT has more active channels than at any previous time. I currently serve as an on-call expert for the SMT, and have previously served as an on-call expert for the CFT. I am also responsible for training shifters to monitor routine data-taking and spot problems for these detectors.

DØ Central Track Trigger Commissioning

I played a key role in the commissioning of the DØ central track trigger. I developed the prototype firmware responsible for receiving and synchronizing data from multiple sources, and storing it for later transmission to the data acquisition system. In this capacity, I identified and analyzed trigger timing issues. Resolving these problems required the rapid production and testing of new revisions of the firmware in simulation, on a test bench, and in the production system. The lessons learned during this process provided valuable inputs to the design of the final synchronization algorithms.

DØ Forward Preshower Construction

During test beam studies of the forward preshower (FPS) and silicon microstrip tracker, I ran tests of the flex circuits used in the prototype readout electronics for both subsystems and oversaw the construction of these electronics for the FPS. Later, I participated in the design, construction and calibration of the LED based pulser system for the forward preshower. To this end, I developed data acquisition and analysis software for the calibration test stand. I took part in the routing of the optical fibers connecting the FPS to the readout electronics. I also initiated and led the effort to verify the fiber connectivity and mapping through use of the pulser system.

CLuEDØ System Administration

From 2001 - 2004 I was a member of a small team of core administrators for the CLuEDØ Linux cluster. During this period, the CLuEDØ cluster was adopted by the DØ collaboration as its primary desktop computing solution, and grew to encompass hundreds of PCs and servers of widely varying configurations. As part of the administration team, I installed new systems, promptly addressed the variety of issues that arise in such a large cluster, and participated in the planning and execution of two cluster-wide operating system upgrades.

DØ Advisory Council

In October 2010, I was elected by the collaboration to the DØ Advisory Council. This is a seven member board that communicate the concerns of the collaboration to the spokespersons, and provides advice on important decisions. Issues that the committee has considered include scientific goals, resource allocation and prioritization, and funding for continued work on the Tevatron.

Teaching Experience

I have several years of experience as a teaching assistant in introductory physics laboratory courses, first at Franklin and Marshall College and subsequently at Stony Brook. At Franklin and Marshall, I also served as a tutor for both the first year physics courses and for the intermediate Electricity and Magnetism course.

At Fermilab, I continue to participate in the Ask-a-Scientist program and attend question-and-answer sessions for tour groups. I also serve as a tour guide for the Fermilab's Saturday Morning Physics program. On occasion, I give tours of DØ to groups of diverse backgrounds, ranging from high school students to visiting scientists. I served as a judge at the Department of Energy sponsored 2009 SERCh competition for undergraduate research. I have also acted as a moderator in the QuarkNet master class for high school students.

Publications:

Publications with direct involvement

1. "Search for $ZH \rightarrow \ell^+ \ell^- b\bar{b}$ production in 4.2 fb^{-1} of $p\bar{p}$ collisions at $\sqrt{s} = 1.96 \text{ TeV}$," V. M. Abazov *et al.* [DØ Collaboration] Phys. Rev. Lett. **105**, 251801 (2010), arXiv:1008.3564 [hep-ex]

2. “The DØ Silicon Microstrip Tracker,” S. N. Ahmed *et al.* [DØ Collaboration], Nucl. Instrum. Meth. A **634**, 8 (2011), arXiv:1005.0801
3. “Cosmic Ray Tests of the DØ Preshower Detector,” P. Baringer *et al.* [DØ Collaboration] Nucl. Instrum. Meth. A **469**, 295 (2001), arXiv:hep-ex/0007026
4. “Amplitudes for Higgs Bosons Plus Four Partons,” R. P. Kauffman, S. V. Desai and D. Risal, arXiv:hep-ph/9903330
5. “Production of a Higgs Pseudoscalar Plus Two Jets in Hadronic Collisions,” R. P. Kauffman and S. V. Desai, Phys. Rev. D **59**, 057504 (1999), arXiv:hep-ph/9808286
6. “Production of a Higgs Boson plus Two Jets in Hadronic Collisions,” R. P. Kauffman, S. V. Desai and D. Risal, Phys. Rev. D **55**, 4005 (1997) [Erratum-ibid. D **58**, 119901 (1998)], arXiv:hep-ph/9610541

Conference Proceedings

1. “Low Mass Higgs at the Tevatron” S. Desai, PoS(HCP2009)047
2. “Radiation Damage Study of the DØ Silicon Microstrip Tracker” S. Desai, PoS(VERTEX 2008)013

Publications with the DØ Collaboration:

I am an author on all Run II publications from the DØ collaboration. A complete list may be found at: <http://www-clued0.fnal.gov/~satish/d0pub.pdf>

Selected Presentations:

1. 19th International Conference on Supersymmetry and Unification of Fundamental Interactions, Fermilab, September 2011: “Tevatron Combination of SM Higgs Searches and 4th Generation Limits”.
2. 23rd Rencontres de Blois, Blois France, June 2011: “Search for Low Mass Higgs at the Tevatron.”
3. 30th Physics in Collision Symposium, Karlsruhe, Germany. September 2010: “Higgs Searches at the Tevatron.”
4. Indiana University, November 2011: “Hunting for the Higgs at DØ”
5. The University of DØ Lecture Series, May 2010: “Making Tracks at DØ”
6. 20th Hadron Collider Physics Symposium, Evian, France. November 2009: “Low Mass Higgs at the Tevatron.”
7. Pheno 2009 Symposium, Madison, Wisconsin, May 2009: “Search for $ZH \rightarrow e^+e^-b\bar{b}$ in $p\bar{p}$ Collisions at DØ”
8. 17th International Workshop on Vertex Detectors, Uto Island, Sweden. July 2008: “Radiation Damage Study of the DØ Silicon Microstrip Tracker”
9. European Physical Society Conference on High Energy Physics, Manchester, England. July 2007: “Searches for Resonant Higgs Production at DØ.”